
**REQUIREMENTS AND ACCEPTANCE OF
DURABLE PAINT PAVEMENT MARKINGS********GENERAL REWRITE********GENERAL**

Durable paint pavement markings as described in Section 2527 of the Standard Specifications shall meet requirements of this IM and Standard Specification 4183.04.

MATERIAL REQUIREMENTS

The marking material shall consist of a binder and retroreflective beads. The marking material shall have less than 150 g/l of volatile organic compounds (VOCs). The material shall be free of lead, chrome and other heavy metals as defined by the Environmental Protection Agency. Upon heating to application temperature, the material shall not exude fumes that are toxic or injurious to persons or property.

The binders shall be pre-approved and listed below. Pre-approval shall be based on data taken from National Transportation Product Evaluation Program (NTPEP) test decks. The test decks shall be located in states that receive a minimum yearly average of 30 inches of snow. Deck locations that are acceptable include Minnesota, Pennsylvania and Wisconsin.

In lieu of NTPEP test data, products may be approved based on a two-year trial of materials applied in Iowa.

Markings shall meet the following minimum requirements. Values shall be averaged from the AC and PCC test decks.

1. After 2 years of exposure on the test deck, the markings shall have a minimum retroreflectivity of 250 mcd/sq. ft./ft.-cdl. for white and 165 mcd/sq. ft./ft.-cdl. for yellow. Measurements shall be made with retroreflectometer using 30-meter geometry. The retroreflectivity shall be measured on a test deck on an area outside of the wheel path.
2. After 2 years of exposure on the test deck, the white markings shall have a minimum daylight reflectance of 48.0. The yellow markings shall have chromaticity coordinates that fall in the following color box:

	x	y
Minimum	0.462	0.428
Maximum	0.501	0.455

The color shall be measured on unbeaded material. The color shall be measured with a standard C illuminant using a two-degree observer and 45/0 geometry.

In addition to meeting the NTPEP test deck requirements, new classes of pavement marking materials shall demonstrate the ability to successfully survive winter snowplow operations on Iowa highways.

PACKAGING AND MARKING

The marking materials shall be shipped in containers that protect the material from spoiling or becoming unfit for use. The containers shall be plainly marked with the following:

- Manufacturer's name
- Product name or number
- Lot or batch number
- Color
- Net weight or volume of material
- Date of manufacture
- Date of expiration

APPLICATION

The Contractor shall supply the Engineer with a copy of the manufacturer's recommendations for applying the marking material. The marking material shall be installed according to the manufacturer's recommendations. Binder thickness shall be the same as applied on the NTPEP deck with a tolerance of $\pm 10\%$. The bead application rate, bead gradation, and bead coating shall be at the discretion of the contractor. An appropriate bead package shall be used to consistently meet or exceed the minimum retroreflectivity requirements.

The contractor shall demonstrate to the engineer at the start of the project the ability to meet the initial retroreflectivity requirements shown in Article 4183.04.

SAMPLING AND ACCEPTANCE

The material manufacturer shall furnish a certification that the material supplied is identical in formulation to one of the pre-approved materials listed above. The manufacturer shall reference the product according to the NTPEP lab number.

The Engineer maintains the right to take field samples to verify material identity.